

MATERIAL SAFETY DATA SHEET

1. SUBSTANCE AND SOURCE IDENTIFICATION

National Institute of Standards and Technology
Standard Reference Materials Program
100 Bureau Drive, Stop 2320
Gaithersburg, Maryland 20899-2320

SRM Number: 2490
MSDS Number: 2490
SRM Name: Non-Newtonian Polymer Solution
for Rheological Measurements
(Polyisobutylene dissolved in
2,6,10,14-Tetramethylpentadecane)

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Description: Standard Reference Material (SRM) 2490 is intended primarily for use in calibration and performance evaluation of instruments used to determine the viscosity and first normal stress difference in steady shear, or to determine the dynamic mechanical storage and loss moduli and shift factors through time-temperature superposition. SRM 2490 consists of a polyisobutylene dissolved in 2,6,10,14-tetramethylpentadecane. One unit of SRM 2490 consists of 100 mL of the solution, which contain a mass fraction of 0.114 polyisobutylene and is packaged in an amber glass bottle.

Substance: Polyisobutylene dissolved in 2,6,10,14-Tetramethylpentadecane

2. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

Component:	Polyisobutylene
Other Designations:	Polyisobutylene (2-methyl-1-propene homopolymer; 2-methylpropene polymers; isobutene homopolymer; isobutene polymer; isobutylene homopolymer; isobutylene polymer; polyisobutene; poly [2-methylpropene])
CAS Number:	9003-27-4
EC Number (EINECS):	Not assigned.
SRM Nominal Concentration (mass fraction):	11.4 %
Component:	2,6,10,14-Tetramethylpentadecane
Other Designations:	2,6,10,14-Tetramethylpentadecane (pristane; robuoy; norphytane)
CAS Number:	1921-70-6
EC Number (EINECS):	217-650-8
SRM Nominal Concentration (mass fraction):	96 %
EC Classification:	Xi
EC Risk (R):	36, 37, 38
EC Safety (S):	2, 24, 25, 26, 46
EC Risk/Safety Phrases:	See Section 15, "Regulatory Information".

3. HAZARDS IDENTIFICATION

NFPA Ratings (Scale 0–4): Health = 2 Fire = 1 Reactivity = 0

Major Health Hazards: Respiratory tract, skin, and eye irritation.

Potential Health Effects

Inhalation: Inhalation of 2,6,10,14-tetramethylpentadecane may cause severe irritation. Inhalation of high concentrations may be destructive to the respiratory tract and mucous membranes. Symptoms include a burning sensation, coughing, wheezing, headache, nausea, and vomiting.

Skin Contact: Acute exposure of 2,6,10,14-tetramethylpentadecane to the skin may cause irritation. Exposure to high concentrations may be destructive to the skin tissues. Repeated or prolonged exposure may cause dermatitis.

Eye Contact: Acute exposure of 2,6,10,14-tetramethylpentadecane to the eye may cause irritation; high concentrations may be destructive to the eye tissues. Repeated or prolonged exposure may cause conjunctivitis.

Ingestion: Ingestion of 2,6,10,14-Tetramethylpentadecane is harmful. Can be irritating to mouth, throat, and stomach. Symptoms may include nausea, headache, and vomiting.

**Listed as a Carcinogen/
Potential Carcinogen:**

Yes No

_____ X In the National Toxicology Program (NTP) Report on Carcinogens.

_____ X In the International Agency for Research on Cancer (IARC) Monographs.

_____ X By the Occupational Safety and Health Administration (OSHA).

4. FIRST AID MEASURES

Inhalation: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing by qualified personnel. Get immediate medical attention.

Skin Contact: Wash skin with soap and water for at least 15 minutes. Remove contaminated clothing and shoes. Get medical attention if necessary.

Eye Contact: Flush eyes, including under the eyelids, with copious amounts of water for at least 15 minutes. Get immediate medical attention.

Ingestion: If a large amount is swallowed, get immediate medical attention.

5. FIRE FIGHTING MEASURES

Fire and Explosion Hazards: Polyisobutylene and 2,6,10,14-tetramethylpentadecane are slight fire hazards.

Extinguishing Media: Use regular dry chemical, carbon dioxide, water, or regular foam.

Fire Fighting: Move container from fire area if possible without exposure to risk. Do NOT scatter spilled material with high-pressure water streams. Avoid inhalation of material or combustion by-products. Wear full protective clothing and NIOSH-approved self-contained breathing apparatus (SCBA).

Component:	2,6,10,14-Tetramethylpentadecane
Flash Point:	> 110 °C (> 230 °F)
Method Used:	Not applicable.
Autoignition Temperature:	Not applicable.
Flammability Limits in Air	
Upper (Volume %):	Not applicable.
Lower (Volume %):	Not applicable.

6. ACCIDENTAL RELEASE MEASURES

Occupational Release: Absorb with sand or other non-combustible material. Collect in an appropriate container for proper disposal.

Disposal: See Section 13, "Disposal Considerations".

7. HANDLING AND STORAGE

Storage: Store and handle in accordance with all current regulations and standards. Store in a tightly closed container. Keep separated from incompatible substances.

Safe Handling Precautions: See Section 8, "Exposure Controls and Personal Protection".

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Limits: No occupational exposure limits established for polyisobutylene or 2,6,10,14-tetramethylpentadecane.

Ventilation: Use a local exhaust ventilation system.

Respirator: For conditions of frequent use or heavy exposure where exposure is apparent and engineering controls are not feasible, respirator protection may be needed. Refer to the "NIOSH Guide to the Selection and Use of Particulate Respirators Certified under 42 CFR 84" for selection and use of respirators certified by NIOSH.

Eye Protection: Wear safety goggles. An eye wash station should be readily available near areas of use.

Personal Protections: Wear appropriate chemical resistant clothing and gloves to prevent skin exposure.

9. PHYSICAL AND CHEMICAL PROPERTIES

Component:	2,6,10,14-Tetramethylpentadecane
Appearance and Odor:	Liquid. Clear. Faint odor.
Molecular Weight:	268.52 g/mol
Molecular Formula:	C ₁₉ H ₄₀
Density:	0.775 g/cm ³ to 0.795 g/cm ³
Solvent Solubility:	Soluble in benzene, carbon tetrachloride, chloroform, ether, organic solvents, and petroleum ether.
Water Solubility:	Insoluble.

10. STABILITY AND REACTIVITY

Stability:	<u> X </u> Stable <u> </u> Unstable Stable at normal temperatures and pressure.
Conditions to Avoid:	Avoid heat, flames, sparks, and other sources of ignition. Avoid contact with incompatible materials.
Incompatible Materials:	Oxidizing materials.
Fire/Explosion Information:	See Section 5, "Fire Fighting Measures".
Hazardous Decomposition:	Thermal decomposition or combustion of 2,6,10,14-Tetramethylpentadecane may release oxides of carbon.
Hazardous Polymerization:	<u> </u> Will Occur <u> X </u> Will Not Occur

11. TOXICOLOGICAL INFORMATION

Route of Entry:	<u> X </u> Inhalation <u> X </u> Skin <u> X </u> Ingestion
Toxicity Data:	No data available for 2,6,10,14-tetramethylpentadecane and polyisobutylene.
Carcinogenic, Tumorigenic, Mutagenic Data:	2,6,10,14-Tetramethylpentadecane has been investigated as a tumorigenic effector.
Health Effects (Acute and Chronic):	See Section 3, "Hazards Identification".

12. ECOLOGICAL INFORMATION

Ecotoxicity:	2,6,10,14-Tetramethylpentadecane:
Fish Toxicity:	Rainbow trout, Donaldson trout (<i>Oncorhynchus mykiss</i>) (physiological): 100 µg/L (7 h)

13. DISPOSAL CONSIDERATIONS

Waste Disposal:	Dispose in accordance with federal, state, and local regulations.
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14. TRANSPORTATION INFORMATION

U.S. DOT and IATA:	Not regulated by DOT or IATA.
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15. REGULATORY INFORMATION

U.S. Regulations:	CERCLA Sections 102a/103 (40 CFR 302.4): Not regulated. SARA Title III Section 302 (40 CFR 355.30): Not regulated. SARA Title III Section 304 (40 CFR 355.40): Not regulated. SARA Title III, Section 313 (40 CFR 372.65): Not regulated. OSHA Process Safety (29 CFR 1910.119): Not regulated. California Proposition 65: Not regulated.
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SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21):

ACUTE: Yes.

CHRONIC: No.

FIRE: No.

REACTIVE: No.

SUDDEN RELEASE: No.

CANADIAN Regulations: WHMIS Classification: Not determined.

National Inventory Status: U.S. Inventory (TSCA): Polyisobutylene and 2,6,10,14-tetramethylpentadecane are both listed on inventory.

TSCA 12b Export Notification: Not listed.

EC Classification: Xi Irritant

EC Risk and Safety Phrases:

R36	Irritating to eyes.
R37	Irritating to respiratory system.
R38	Irritating to skin.
S2	Keep out of reach of children.
S24	Avoid contact with skin.
S25	Avoid contact with eyes.
S26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S46	If swallowed, seek medical advice immediately and show container or label.

16. OTHER INFORMATION

Sources: MDL Information Systems, Inc., MSDS *2,6,10,14-Tetramethylpentadecane* 16 June 2005.
MDL Information Systems, Inc., MSDS *Polyisobutylene* 19 March 2003.

Disclaimer: Physical and chemical data contained in this MSDS are provided only for use as a guide in assessing the hazardous nature of the material. The MSDS was prepared carefully, using current references; however, NIST does not certify the data in the MSDS. The certified values for this material are given in the NIST Certificate of Analysis.